



# THE MARS PLAYGROUND

What would it be like to play on Mars?

Would playing change in the martian environment?

Can you jump higher?

Run faster?

Kick a ball farther?

Would balls bounce differently?

Would a kite fly?

Could you hop farther in hopscotch?

Does it hurt to fall?



# THE MARS PLAYGROUND

## Overview:

The Mars Playground provides a fun context to learn about the unique environment of Mars. If we take many of the games that children play and transfer them to the Mars environment, we notice that many of the physical aspects of playing change dramatically. Kids could jump three times higher, climb with three times the strength, and fall three times more slowly. Through talking about the reduced gravity on Mars, to the very thin atmosphere, we find out that Mars would provide a really fun environment to play in.

## Instructions:

### Download includes:

1. Silhouettes depicting various types of play (eps & pdf files).
2. Text cards that describe each silhouette and how each particular activity would change in the Mars environment.
3. Instructions on how to make the silhouettes.
4. Instructions on how to make the hopscotch court.
5. Banner Art

**We recently held this exhibit at the JPL Open House 2005 and have some helpful hints on how to best set up the exhibit. Here are a few suggestions.**

## Making the Silhouettes:

There are two types of files provided to make the artwork.

1. EPS Files
2. PDF Files

### EPS files:

To create the cleanest cuts while making the silhouettes we recommend sending the EPS files to a laser cutting service. Cutting the silhouettes out of black polycarbonate sheets seems to work very well. Lightweight polycarbonate, 0.02 -0.03 MM, will provide sufficient structure without getting too heavy to mount up on the wall. For a more finished look, have the laser cutting service mount black fabric to the polycarbonate before they make the laser cuts. There are many types of exhibit fabrics that will work well. Ask the laser cutting service for some examples.

There is a one foot scale reference in the left hand corner of the eps file that the laser cutting service can use to scale all of the silhouettes. The final result is a silhouette with sharply defined lines that exactly match the digital file.

**PDF files:**

These files can be used to print out on a large-format ink jet printer. Take the file to a printing service and use the heaviest weight paper you can print on. After the prints have been made, cut out the shapes so they can be mounted up on the wall. You could also simply mount the printed paper onto the wall if you do not want to cut out the silhouettes.

**Mounting:**

Heavy-duty earthquake Velcro worked very well for mounting the silhouettes to a wall. If you have silhouettes cut out of very thin material such as paper, a lighter type of double stick tape or poster tape may be sufficient. Also, this will also reduce any noticeable bump the thick Velcro may cause that is visible on the front side of the silhouette.

**Designing the wall:**

Once you have the artwork ready for mounting it is up to you to decide where each silhouette will be placed on the wall. They can be side by side or scattered throughout the space. Think about how children play and design the wall space with that in mind.

**Making the Hopscotch Court:**

The Hopscotch Court is a fun and interactive way to illustrate the difference in gravity between Earth and Mars. Because Mars has about  $\frac{1}{3}$  the Earth's gravity, one can hop three times farther with the same effort.

Because a "hop" is a relative distance, you may choose to place the squares at the distance you feel is right. This activity is meant to demonstrate the general concept of jumping farther on Mars and not necessarily the distance a person could jump on Mars. In general, squares that are placed farther apart seem to illustrate the concept better.

We noticed that squares that were fairly far apart, (6-8 feet) really attracted kids to jump from one square to the next to see if they could do it. If they have to exert a little effort to make the jump, it may punctuate the fact that jumping the same distance would be much easier on Mars.

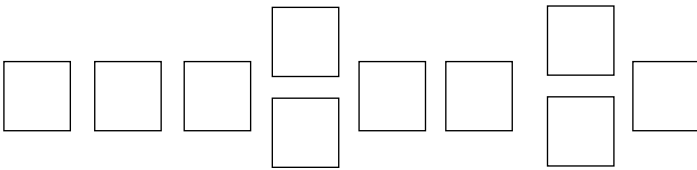
**Materials;**

White tape, (Cloth Tape)

Clear Packing tape

**Directions:**

1. Make nine 1.5 foot squares with the tape
2. Space the squares at equal distances apart.
3. Create the following pattern.



4. Cover the white tape with the clear packing tape so that it does not get dirty.
5. Print out the description sign and place it near the front of the hopscotch court.

## DESCRIPTION CARDS



### WHAT WOULD IT BE LIKE TO PLAY ON MARS?

Mars is much smaller than the planet Earth. It has four seasons like Earth, but each season is twice as long. Its smaller mass means that it has less gravity. You could jump higher and stay in the air three times as long. You could throw a ball farther and climb with three times the strength. Mars would be a lot of fun to play on.



**Go Long** -With only  $\frac{1}{3}$  gravity on Mars, your ball will fall back to the ground three times slower. That means that you could throw three times as far. On Mars, an average kid could throw like an NFL quarterback.



**Gymnastics**- On Mars you are  $\frac{1}{3}$  your weight and can stay suspended in the air three times longer. Be careful though -you will land with the same force as you would here on Earth, so a bad landing could hurt.



**Climb Up**- Mars would be a great place for climbing. Because of the  $\frac{1}{3}$  gravity you are three times as strong. You could easily do a pull up with one hand, maybe even a few fingers.



**Skateboarding**. On Mars, you could ollie three times higher and three times farther. The highest ollie recorded here on Earth comes in at just over 3.5 feet. That would be a 10.5 - foot ollie on Mars.



**Home Run** - No curve balls on Mars. Because of the thin atmosphere, there would be very little air friction to make the ball curve. It would go perfectly straight every time.

If you hit one, your ball will go three times as far. A pro-ball player could hit it almost 1,200 feet. That's almost a quarter mile.



**Slam Dunk** - With  $\frac{1}{3}$  the gravity, you could jump three times as high. We would have to raise the hoop on Mars.



**Hopscotch**. You can hop three time farther on Mars.